

Co and Ni Magnetic Nanocontacts (B. Doudin, S.H. Liou, S.S. Jaswal, E.Y. Tsymbal)

Magnetic nanocontacts have shown interesting and large magnetoresistance effects that might

Have potential in high-sensitivity sensors. We have prepared Co and Ni magnetic nanocontacts with

Focused-ion-beam and electrodeposition methods. The figure below (left) shows the junction and the

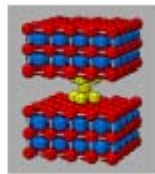
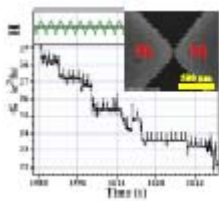
Graph shows quantum conductance steps, indicating a Ni junction of dimensions less than

1 nanometer. The nanocontact has been modeled with a structure shown at the right. The electronic

Structure and conductance was calculated and the result showed that atomic size contacts can produce

Fully spin polarized currents as well as act as a valve that can be switched between conducting and

Non-conducting states. Further research may lead to significant applications.



Nanotube Magnetism (D.J. Sellmyer, R. Skomski)

We have introduced a novel nanomagnetic system magnetic nanotubes. Magnetic FePt and

Fe₃O₄ nanotubes have been prepared by hydrogen reduction in nanochannels of porous alumina

Templates, and investigated by electron microscopy, X-ray diffraction analysis, and magnetic

measurements. The versatility of the method means that alloy nanotubes with a wide range of

Parameters can be produced. The figure below shows a bundle of Fe₃O₄ nanotubes with magnetic

Properties that are explained in terms of a tubular random-anisotropy model. The figures on the right

Show possible types of spin structures that may be created in nanotubes, some with significant

Applications in information or other nanotechnologies.

